

OJ - SM6-262

REMARKS/ARGUMENTS

The Office Action Summary that is the subject of this response indicates that Claims 3,4, 6-8, 11, 12 and 14-16 are pending in the present application with all of these pending claims standing rejected under 35 USC 103(a), as being unpatentable over Horsky, (US 6,107,634), in view of Foad ((US 5,977,552) and Inada et al (US 3,953,528).

By the present response, claims 4 and 12 are amended for a second time to clarify that the present invention includes a gas injector for injecting gas into a mass of source material within a crucible for improving heat transfer therebetween. Claims 3 & 6, as well as claims 11 & 14, were previously amended to depend from independent claims 4 & 12, respectively. Claims 7, 8, and claims 15 & 16 remain in the original form, indirectly depending from independent claims 4 and 12, respectively. As such, the present amendment leaves claims 3,4, 6-8, 11, 12 and 14-16 for consideration based on the clarifying language added to claims 4 and 12. Reconsideration and allowance of these claims is respectfully requested in view of the above amendment and the following remarks.

By the present Office Action, the Examiner acknowledges that the primary reference to Horsky ('634) does not disclose all of the elements of the claimed invention, and more specifically, that Horsky does not disclose a gas injector for injecting gas into said cavity. However, the Examiner cites the reference to Foad ('552) for its disclosure of a gas injector for injecting gas into a crucible, arguing that the motivation of combining Foad and Horsky "... is to achieve higher production of ions extracted from the arc chamber in order to gain the beam current implanted on the target substrate as taught by Foad (column 8, line 10-16)." In fact, Foad further states that gas passes over the source material to react with the source material and produce a different gas material which is conducive to more efficient production of ions.

By contrast, Applicants note that the present invention is directed "... providing a mechanism for improving the thermal conductivity between the walls 64 and the source material 68." (paragraph 0027). Indeed, the specification of the present patent application specifically states:

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"Gas that enters the cavity 66 via orifice 104 functions to improve the heat transfer characteristic between the crucible walls 64 and the source material 68 being vaporized in the crucible. In this manner, source material is efficiently and completely vaporized, increasing the time during which the crucible can provide vaporized decaborane for a given amount of decaborane material 103." (paragraph 0028)

Thus, the present invention provides a gas injector for injecting gas into the source material to improve heat transfer between crucible walls and the source material. The prior art presented by the Examiner does not disclose, nor does it teach or suggest, the notion of injecting gas into a source material within a crucible to improve heat transfer thereto.

By the present amendment, Applicants amend the claim language of the independent claims, namely claims 4 and 12, to more clearly define a source material including a crucible and crucible walls defining a cavity for receiving a mass of source material in a solid state, and a gas injector (104) for injecting gas into the mass of the source material for improving heat transfer between the crucible walls and the source material. Applicants submit that the motivation for providing a gas injector in an ion source for the purpose of passing gas through a mass of source material to provide improved heat transfer is significantly different than an ion source having a crucible wherein injected gas is passed over the source material to provide a different gas material created by the chemical reaction between the source material and the injected gas, wherein the different gas is to be fed to the ion source arc chamber.

Applicants respectfully submit that presently amended independent claims 4 and 12 are allowable and that dependent claims 3, 6-8, 11, and 13-16 are also allowable for the same reasons that claims 4 & 12 are allowable. Applicants, therefore, respectfully submits that the claims currently remaining for consideration in the present application are in condition for immediate allowance, which action is earnestly solicited.

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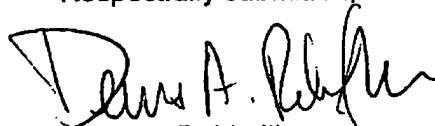
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If there are any additional charges with respect to this amendment or otherwise, please charge them to Deposit Account 502294, maintained by the assignee to the present patent application.

Respectfully submitted,



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